



Dart Hawkesbury
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D3391-023
Job Sheet 166956-G



Part No: D3391-023

Job Qty: 1 ea

Part Name: Mid Tube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 10/20/17

Job Tracking No:

Due Date: 12/8/17

Created By: Mario Poulin

Type: SOLD

Description:

Customer: Abu Dhabi Aviation (CABUD01)

PO Box 2723, Abu Dhabi International Airport Abu Dhabi, , 2723 United Arab Emirates ph:971 2 575 8000
fx:971 2 575 7775.

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		12/7/17	0.00	0.00	Start Up Skid tubes		
100	Skid tubes	1 pcs		12/7/17	0.88	2.11	Skid tubes		
110	QC	1 pcs		12/7/17	0.00	0.00	QC5		
120	HandFinish	1 pcs		12/7/17	0.00	0.38	HandFinish1		
130	QC	1 pcs		12/7/17	0.00	0.00	QC7		
140	Skid tubes	1 pcs		12/7/17	0.00	2.11	Skid tubes		
150	QC	1 pcs		12/7/17	0.00	0.00	QC5		
160	Skid tubes	1 pcs		12/7/17	0.00	2.11	Skid tubes		
170	QC	1 pcs		12/7/17	0.00	0.00	QC10		
180	QC	1 pcs		12/7/17	0.00	0.00	QC5		
185	HandFinish	1 pcs		12/7/17	0.00	0.38	HandFinish2		
191	Spray Paint	1 pcs		12/7/17	0.00	0.91	Spray Paint		
200	QC	1 pcs		12/7/17	0.00	0.00	QC14		
230	HandFinish	1 pcs		12/8/17	0.00	0.38	HandFinish4		
240	QC	1 pcs		12/8/17	0.00	0.00	QC5		
250	Packaging	1 pcs		12/8/17	0.00	0.00	Packaging3		
260	QC21-SA	1 Ea		12/8/17	0.00	0.00	QC21		

Part Op 100 - 1-Cut tube to finish length as per Dwg D3391 2-Drill pilot holes using DT8796 (Do not drill "B" holes) and drill only 1
Descriptions: fwd saddle hole on one side only as per Dwg D3391 3-Open aft saddles and GHW holes to Ø0.4375" except for fwd saddle
holes 4-Remove .030" from Fwd indexing Ridge as per Dwg D3391 5-Remove indexing ridge on Fwd & Aft end of
skid tube as per Dwg D3391 6-Debur, scribe batch # on aft end. 7- ~~Locate D3391-021 in D3391-023 at 9:00" (see view~~
~~F-F) 8- Transfer drill one fwd saddle hole only to .188" dia, transfer drill all remaining fwd saddle holes using DT 8149~~
locating from previously drill .188" dia hole, using tips and clips to ensure perfect alignment, open up previously transfer
drilled pilot holes in D3391-023/021 using drill press. ON FIRST SIDE ONLY drill out 2nd and forth fwd saddles holes to
0.500" as per ON 2ND SIDE ONLY ream out 2nd and forth saddle hole to 0.499". D3391-021
BATCH: ~~9- Drill #30 pilot holes using wearplate Jig DT8217 Identify Ø0.375" holes with paint marker,~~
~~***DO NOT DRILL HOLES #3-19-20 FROM FWD END OF JIG*** Locating from two fwd wearplate holes in D3391-023~~
~~drill remaining 6 wearplate holes in D3391-021 using DT8937~~ 10- Open wearplate holes of D3391-023 assembly detail
section G-G to Ø0.375" (10 holes) as per Dwg D3391 Open wearplate holes of D3391-023 assembly detail section H-H to
Ø0.297" (20 holes) as per Dwg D3391 Debur and blow out all chips from inside tube, scribe
140 - 1-Open float bag holes as per dwg 2-C'sink float bag holes as per dwg 3- Prepare tube for welding 4-Bond web in
place as per Dwg D3391 & QSI 015. Adhere for 12 hours) A/R Sikaflex exp 2018-04-21 batch#: M138654
NOTE:ENSURE WEB IS INSERTED IN AFT END OF TUBE
160 - 1-Weld crossbolt spacer as per dwg D3391 & QSI 004 2-grind weld flush A/R M138673

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order: _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐
Part No. _____	
NCR No. _____	

Date : _____	Step #: _____
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Description Work Order Deviation

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Root Cause	
Environment ☐	No Re-verification ☐
Design ☐	Operator ☐
Doc/Data ☐	Offset/Setup ☐
Equip/Tooling ☐	Supplier ☐
Handling/Pre ☐	Training ☐
Material ☐	Use for Testing ☐
Internal Transport ☐	Poor Information ☐
Tribal Knowledge ☐	Rushing ☐
LOA ☐	Product Improvement ☐
Substation ☐	Process Improvement ☐
Past Expiry Date ☐	Manufacturing Process ☐
Misidentified ☐	Past Due ☐

Pressure/Forced ☐
Bending ☐
Centre Not Concentric ☐
Cracks ☐
Crimp/Kink/Ripple/Wave ☐
Cuffs ☐
Crushing ☐
Heat Treat ☐
Wave/Twist in Tube ☐
Marks/Chatter ☐

Temperature/C ☐
Set-up ☐
BOM/Route ☐
Broken/Damage/L ☐
Inspection Incompl ☐
Contamination ☐
Countersink ☐
Cut Too Short ☐
Instructions Incomple ☐
Drill Holes ☐

PART NO:
Revision:
Operation:
Change No:

Start up Operation
D3391 - 023

Mfg Date: 11/28/17
Job No: 166956-G



Engineering ☐
Quality ☐
Other ☐

RB (QSI042) Approval

Completed By

nd / Supervisor
al Verification

ordinator
oval

Dart Aerospace Ltd.
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Hawkesbury, ON K6A 1K7
CANADA
TEL: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

rong
isions
erance

Drawing ☐
Finish ☐
Misread ☐
Turning Sequence ☐

Fit/Function ☐
Misaligned/off center ☐

OTHER :

185 - Re-alodine

191 - PRIME AS PER DWG AND QSI005 4.2.1.3.3 PRIMER BATCH: _____ PAINT AS PER DWG AND QSI005 4.2.2.4 PAINT: _____

230 - 1-Install Inserts as per Dwg

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D2500-1-190 159717	1	90	0	0
140-Skidtubes	D3389-1 5018928	1	3	0	0
160-Skidtubes	5 spacer D3681-1 5019147	5	135	0	0
230-HandFinish	ALS4-1032-130 5007279	20	11,077	0	0
	D3591-1 M165301-108	2	85	0	0

Part Specifications

Specifications could not be found.

Plex 11/7/17 9:21 AM dart.poulin.mario

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : ☐					

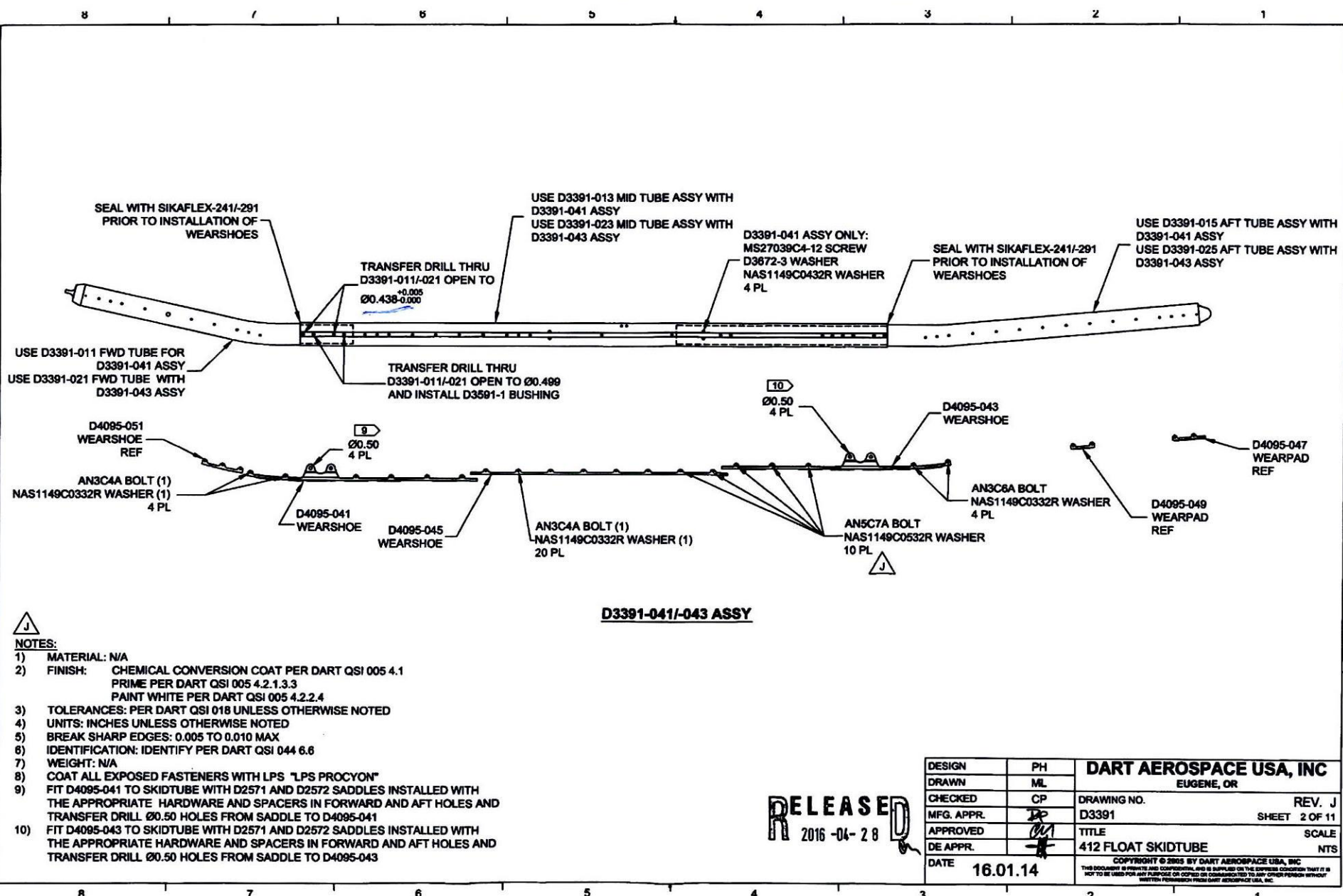
D3391-041/-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST

QTY -041	QTY -043	PART NUMBER	DESCRIPTION
X	X	D3391-041	FLOAT SKIDTUBE ASSEMBLY
		D3391-043	FLOAT SKIDTUBE ASSEMBLY
1		D3391-011	FWD TUBE ASSEMBLY
1		D3391-013	MID TUBE ASSEMBLY
1		D3391-015	AFT TUBE ASSEMBLY
	1	D3391-021	FWD TUBE ASSEMBLY
	1	D3391-023	MID TUBE ASSEMBLY
	1	D3391-025	AFT TUBE ASSEMBLY
2	2	D3591-1	BUSHING
4		D3672-3	WASHER
1	1	D4095-041	WEARSHOE
1	1	D4095-043	WEARSHOE
1	1	D4095-045	WEARSHOE
1	1	D4095-047	WEARPAD
1	1	D4095-049	WEARPAD
1	1	D4095-051	WEARSHOE
24	24	AN3C4A	BOLT
4	4	AN3C6A	BOLT
10	10	AN5C7A	BOLT
28	28	NAS1149C0332R	WASHER
10	10	NAS1149C0532R	WASHER
4		MS27039C4-12	SCREW
4		NAS1149C0432R	WASHER



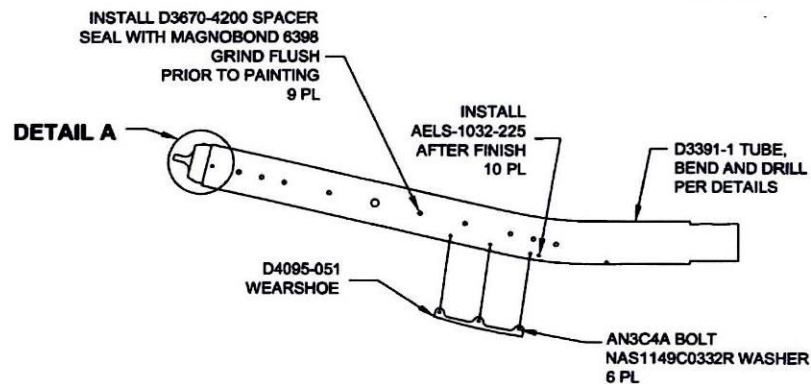
J	INCORPORATED DSI 9733, REFORMAT DRAWING CHANGED CSORE DEPTH (ZN D2-8, D2-9), REVISED TABLES, REPLACED POWDER COAT WITH PAINT	ML	16.01.14
I	REMOVE GASKETS AND REPLACE ALL WEARSHOES; PARTS LIST UPDATE, ZN A8-1, ZN A8-2, ZN A8-4, ZN B6-8; LPS-3 COATING REMOVED FROM NOTE 2, ZN A3-1, ZN A3-2, REMOVED INSERT AELS-1032-130, ZN B6-4, B2-4, C7-8, C3-8; REMOVED HOLES, ZN D6-4 ZN D2-4, ZN D7-8, ZN D3-8	XDF	11.10.13
H	DRAWING UPDATED TO CURRENT STANDARDS. SHT 1 PL ADDED D3591-1 BUSHING. ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. SHT 2 PL ADDED D3591-1 BUSHING. ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. (FOR FURTHER INFO SEE DSI 9364 & NCR 08-074)	AJS	08.08.20
G	REPLACE NAS INSERTS W/ AELS INSERTS SWITCH TO D3670-XXXX SPACERS FOR INSTALLING FLOAT BAGS, DWG REORGANIZED FOR CLARITY	DC	07.07.31
F	ADD SS WEARSHOE, GASKET REMOVE FWD SADDLE HOLE -011/-021	PH	07.01.18
E	CHANGE TOLERANCE, EASE MANUFACTURE	PH	08.04.25
D	UPDATE TOLERANCE, CHANGE HOLE SIZE	PH	08.01.23
C	LENGTHEN AFT EXTENSION	PH	05.09.27
B	DRAWING UPDATES	PH	05.06.10
A	NEW ISSUE	PH	05.02.07
REV	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE USA, INC EUGENE, OR	
DRAWN	ML		
CHECKED	CP	DRAWING NO.	REV. J
MFG. APPR.	LP	D3391	SHEET 1 OF 11
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	412 FLOAT SKIDTUBE	NTS
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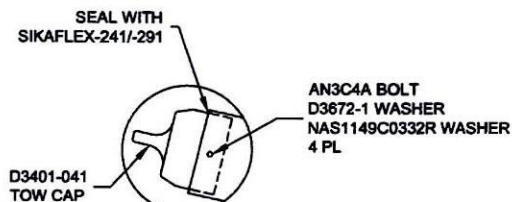


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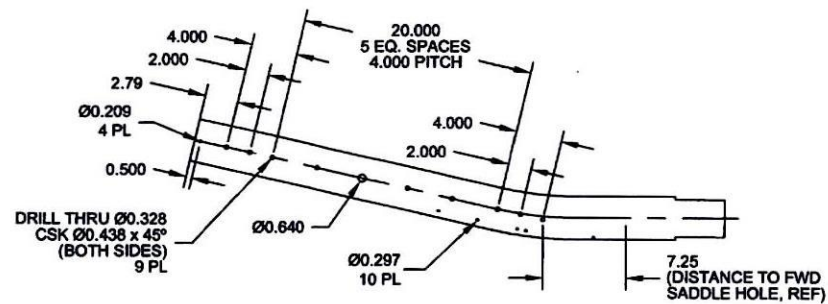
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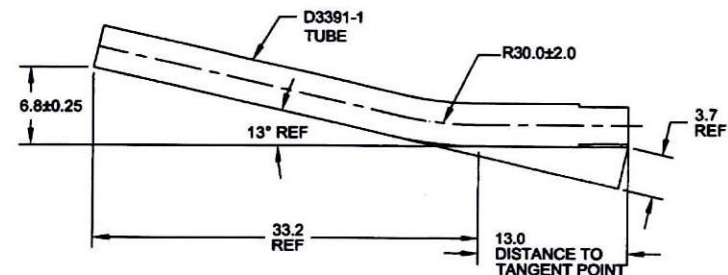
D3391-011 FWD TUBE ASSEMBLY
ASSEMBLY DETAIL



DETAIL A
SCALE 2X



D3391-011 DRILLING DETAIL



D3391-011 BENDING DETAIL
(MAKE FROM D3391-1)

D3391-011 FWD TUBE ASSEMBLY PARTS LIST

QTY -011	PART NUMBER	DESCRIPTION
X	D3391-011	FWD TUBE ASSEMBLY
1	D3391-1	TUBE
1	D3401-041	TOW CAP
9	D3670-4200	SPACER
4	D3672-1	WASHER
1	D4095-051	WEARSHOE
10	AELS-1032-225	INSERT
10	AN3C4A	BOLT
10	NAS1149C0332R	WASHER

DESIGN	PH	DART AEROSPACE USA, INC	
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CHECKED	CP	DRAWING NO.	REV. J
MFG. APPR.		D3391	SHEET 3 OF 11
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INSTALL D3670-4200 SPACER
SEAL WITH MAGNOBOND 6398
GRIND FLUSH
PRIOR TO PAINTING
4 PL

DETAIL B



D4095-051
WEARSHOE

INSTALL
AELS-1032-225
AFTER FINISH
10 PL

AN3C4A BOLT
NAS1149C0332R WASHER
6 PL

D3391-021 FWD TUBE ASSEMBLY ASSEMBLY DETAIL

SEAL WITH
SIKAFLEX-241/-291

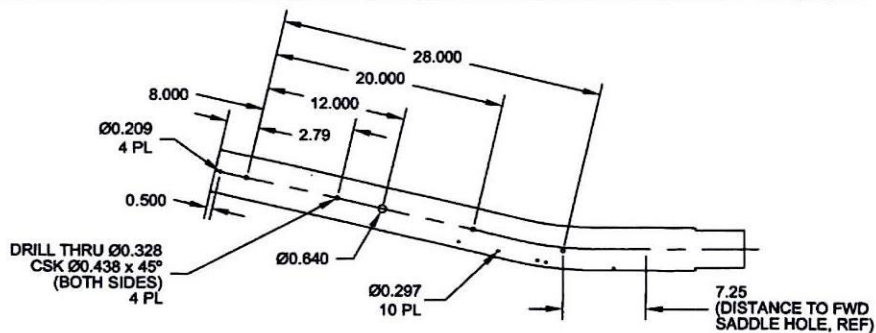
D3401-041
TOW CAP

DETAIL B SCALE 2X

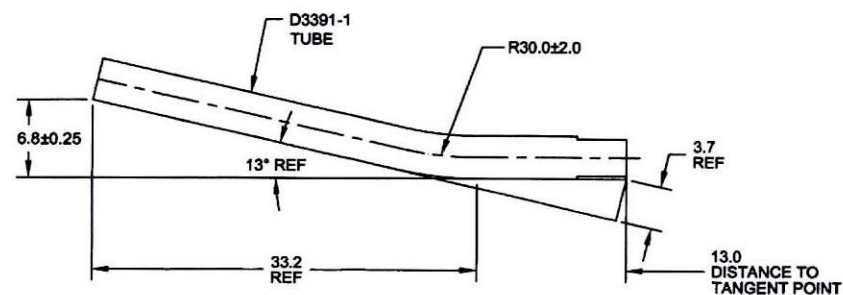
AN3C4A BOLT
D3672-1 WASHER
NAS1149C0332R WASHER
4 PL

D3391-021 FWD TUBE ASSEMBLY PARTS LIST

QTY -021	PART NUMBER	DESCRIPTION
X	D3391-021	FWD TUBE ASSEMBLY
1	D3391-1	TUBE
1	D3401-041	TOW CAP
4	D3670-4200	SPACER
4	D3672-1	WASHER
1	D4095-051	WEARSHOE
10	AELS-1032-225	INSERT
10	AN3C4A	BOLT
10	NAS1149C0332R	WASHER



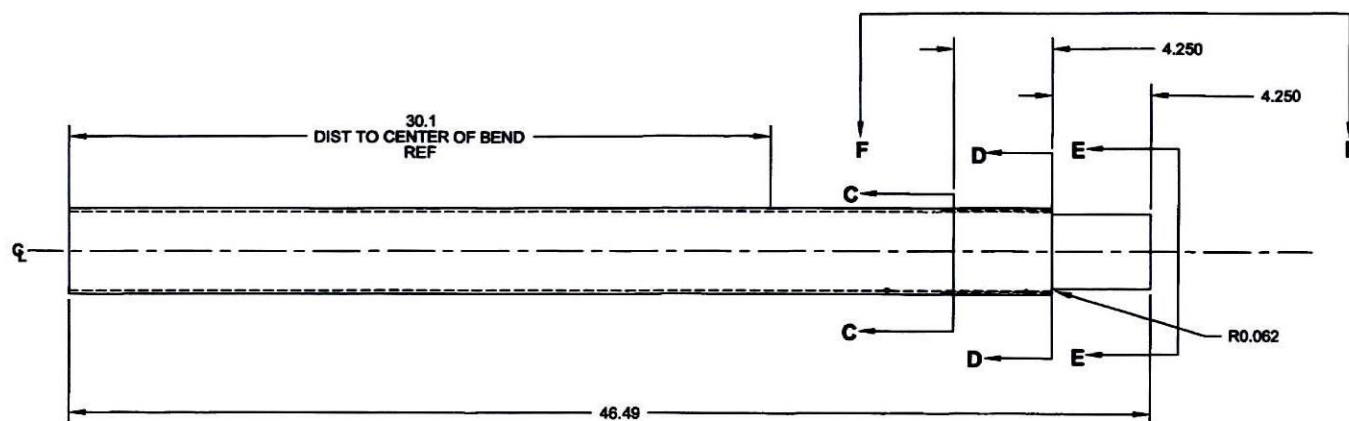
D3391-021 DRILLING DETAIL



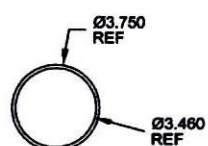
D3391-021 BENDING DETAIL (MAKE FROM D3391-1)

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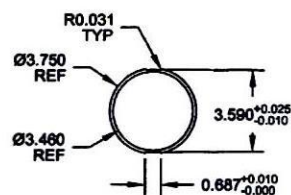
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CHECKED	CP	DRAWING NO.	REV.
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APPROVED	<i>DB</i>	TITLE	SCALE
DE APPR.	<i>DB</i>	412 FLOAT SKIDTUBE	NT
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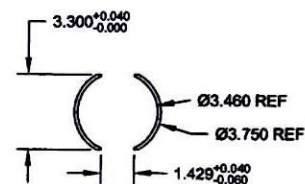
D3391-1 TUBE
(MAKE FROM D8013-047 SKIDTUBE MATERIAL)



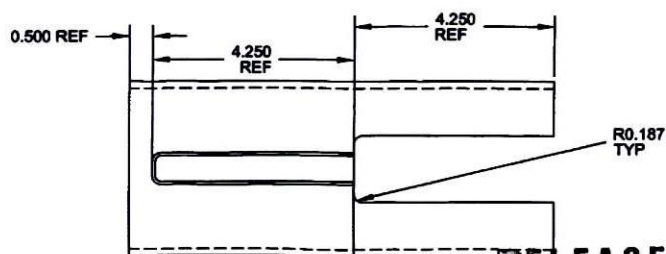
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SECTION D-D



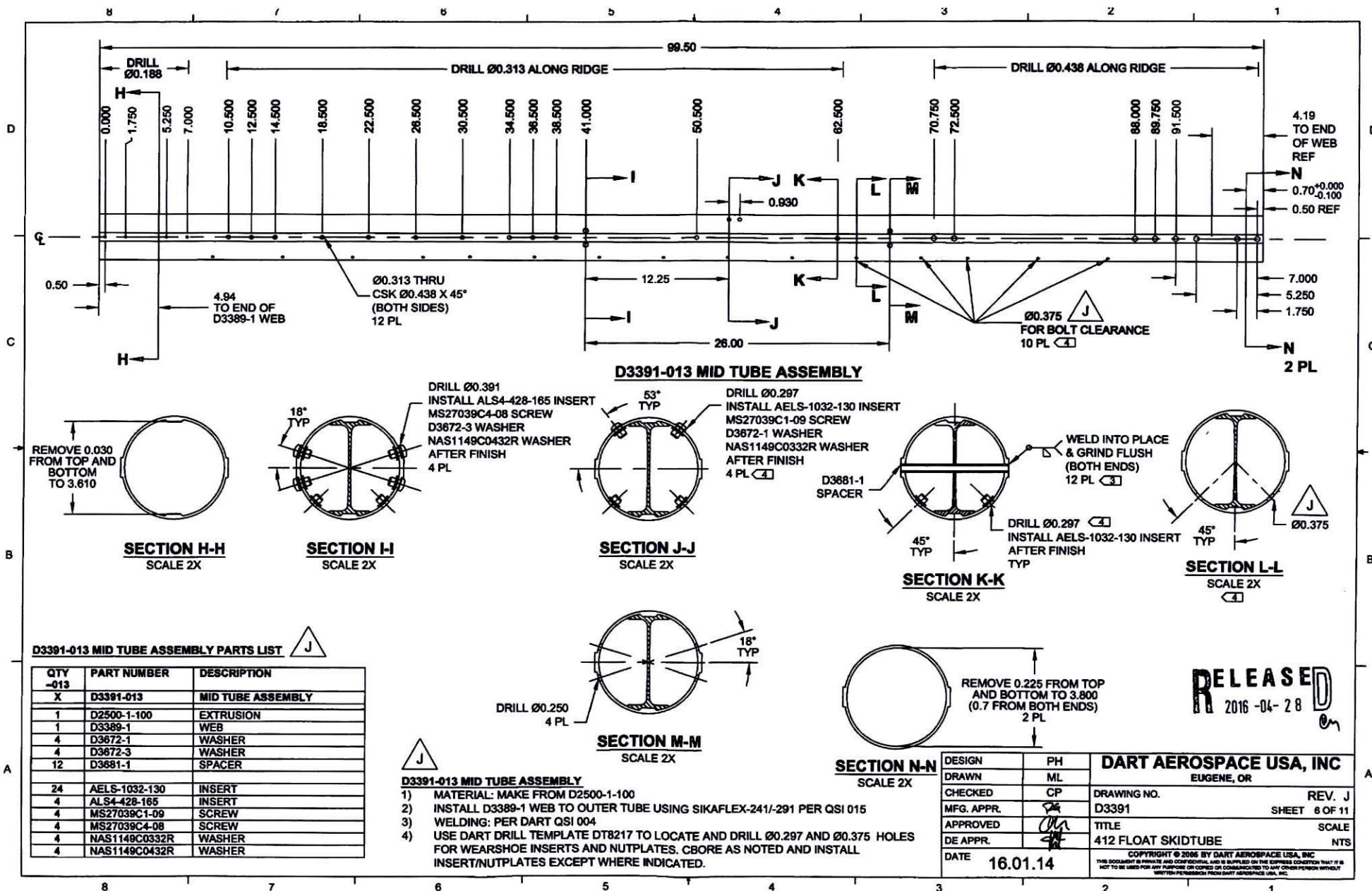
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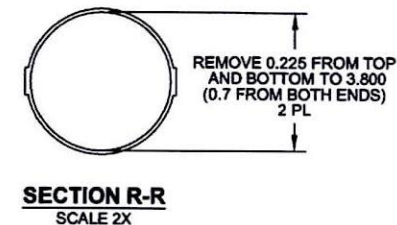
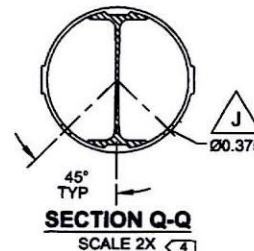
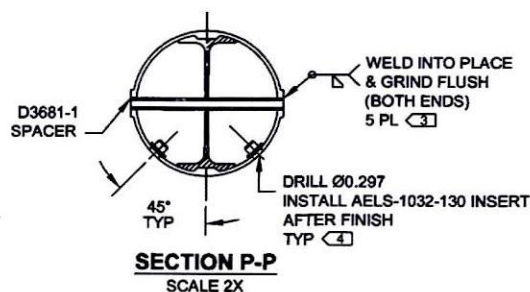
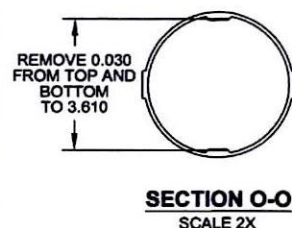
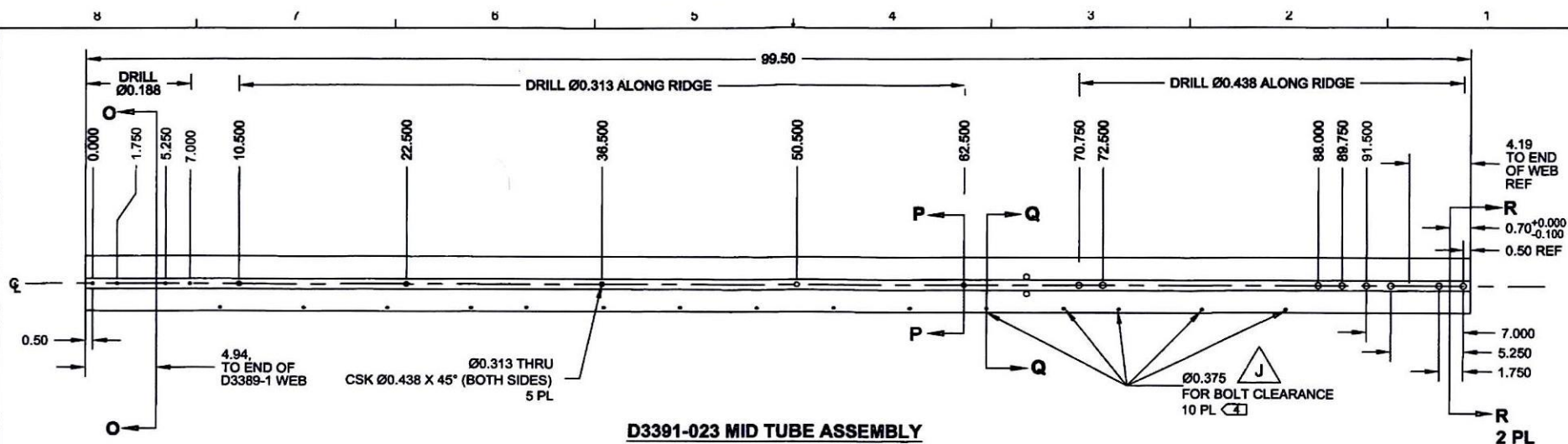


VIEW F-F
SCALE 2X

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2016-04-28

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MFG. APPR.	22	D3391	SHEET 5 OF 1
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D3391-023 MID TUBE ASSEMBLY PARTS LIST

QTY -023	PART NUMBER	DESCRIPTION
X	D3391-023	MID TUBE ASSEMBLY
1	D2500-1-100	EXTRUSION
1	D3389-1	WEB
5	D3681-1	SPACER
20	AELS-1032-130	INSERT

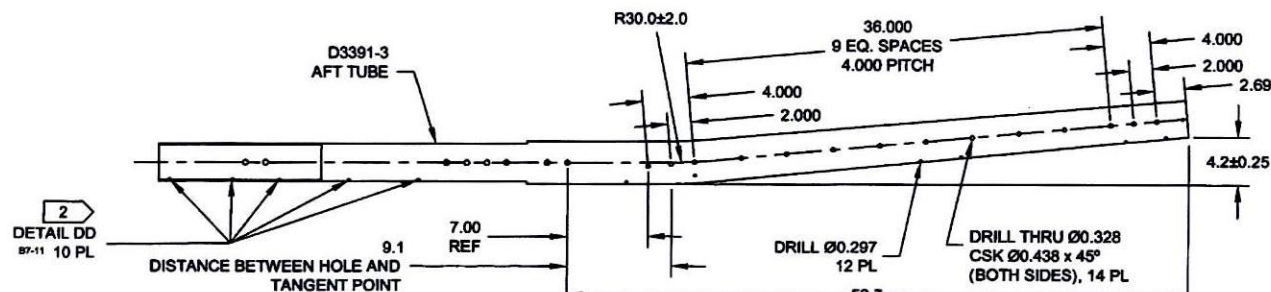
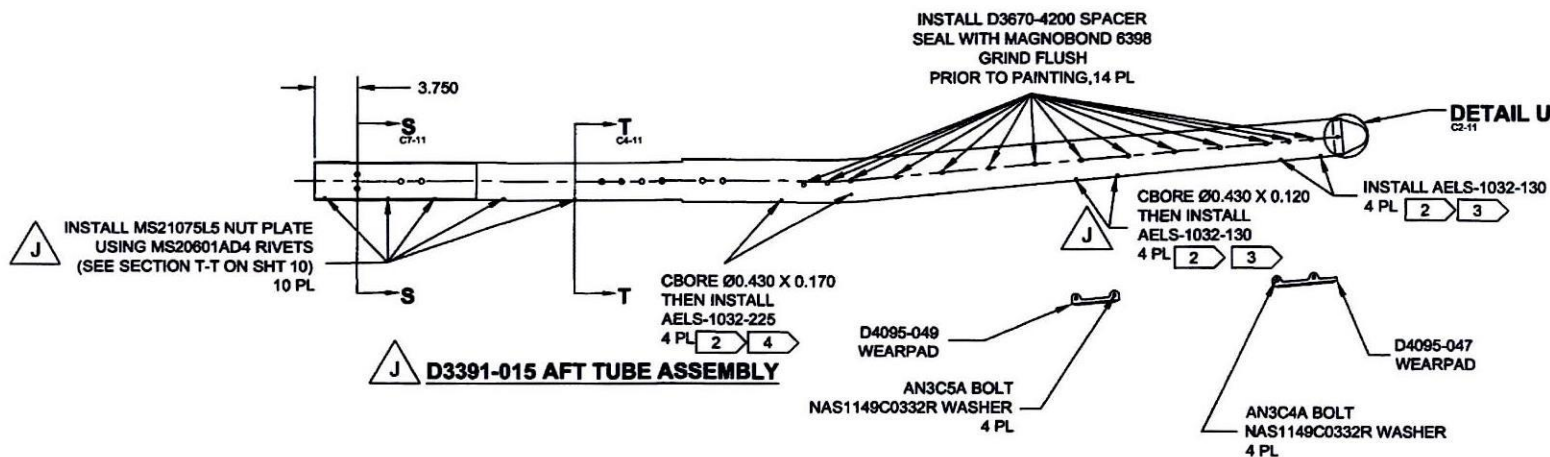


D3391-023 MID TUBE ASSEMBLY

- 1) MATERIAL: MAKE FROM D2500-1-100
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/-291 PER QSI 015
- 3) WELDING: PER DART QSI 004
- 4) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. CBORE AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED.

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D3391-015 AFT TUBE ASSEMBLY PARTS LIST

QTY	PART NUMBER	DESCRIPTION
X	D3391-015	AFT TUBE ASSEMBLY
1	D2646	AFT CAP
1	D3391-3	AFT TUBE
14	D3670-4200	SPACER
2	D3672-1	WASHER
1	D4095-049	WEARPAD
1	D4095-047	WEARPAD
8	AELS-1032-130	INSERT
4	AELS-1032-225	INSERT
4	ALS4-428-165	INSERT
6	AN3C4A	BOLT
4	AN3C5A	BOLT
20	MS20601AD4	RIVET, BLIND
10	MS21075L5	NUT PLATE, FLOATING
10	NAS1149C0332R	WASHER

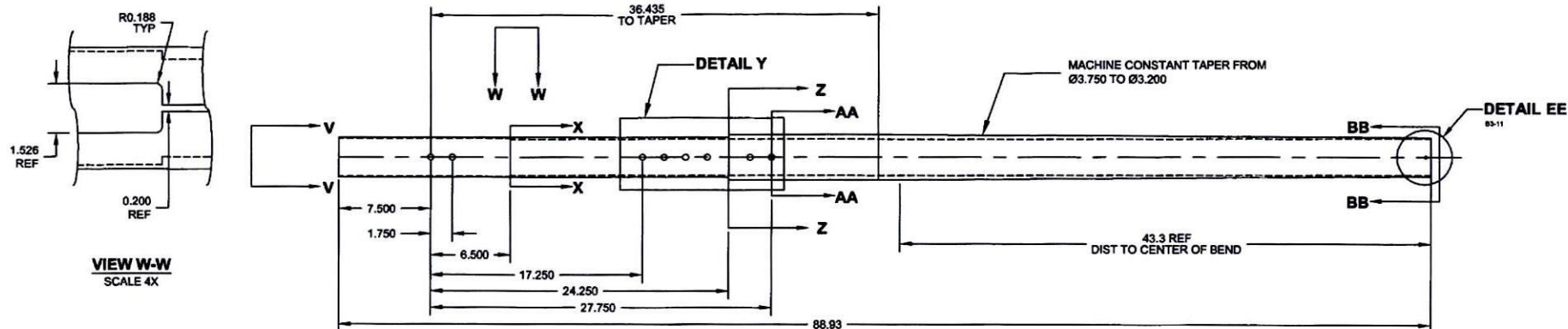
NOTES:

- 1) COAT ALL EXPOSED FASTENERS WITH LPS "LPS PROCYON"
- 2) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 AND Ø0.375 HOLES FOR WEARSHOE INSERTS AND NUTPLATES. CBORE AS NOTED AND INSTALL INSERT/NUTPLATES EXCEPT WHERE INDICATED.
- 3) ENSURE WALL THICKNESS IS BETWEEN 0.070 AND 0.130 BEFORE INSTALLING INSERT
- 4) ENSURE WALL THICKNESS IS BETWEEN 0.130 AND 0.225 BEFORE INSTALLING INSERT

BENDING AND DRILLING DETAIL

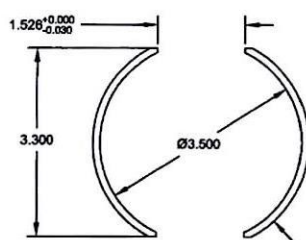
RELEASED
2016-04-28

DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	ML	EUGENE, OR	
CHECKED	CP	DRAWING NO.	REV. J
MFG. APPR.		D3391	SHEET 8 OF 11
APPROVED		TITLE	SCALE
DE APPR.		412 FLOAT SKIDTUBE	NTS
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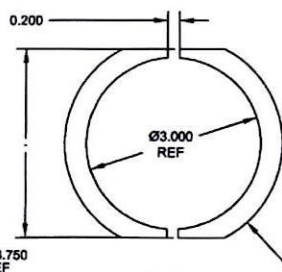


VIEW W-W
SCALE 4X

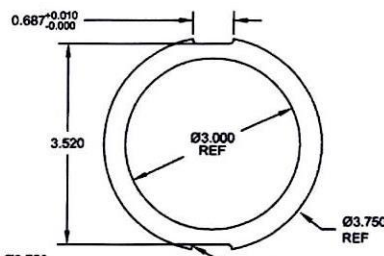
D3391-3 AFT DRILLING AND CUTTING DETAIL
(MAKE FROM D6014-090)



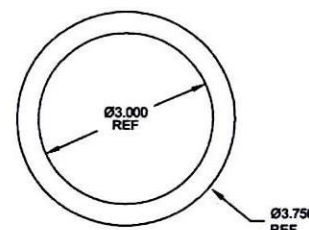
SECTION V-V
SCALE 4X



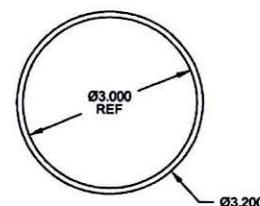
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SCALE 4X



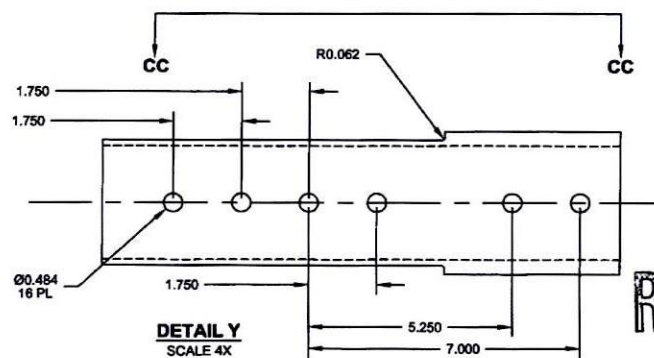
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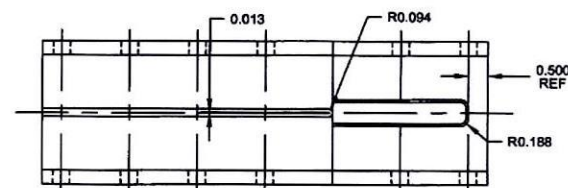
SECTION AA-AA
SCALE 4X



SECTION BB-BB
SCALE 4X



DETAIL Y
SCALE 4X

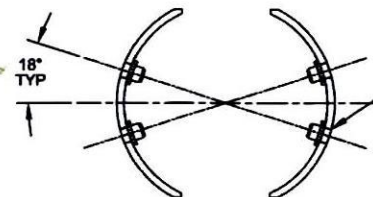


VIEW CC-CC

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MFG. APPR.	<i>DFR</i>	D3391	SHEET 10 OF 11
APPROVED	<i>DFR</i>	TITLE	SCALE
DE APPR.	<i>DFR</i>	412 FLOAT SKIDTUBE	NTS
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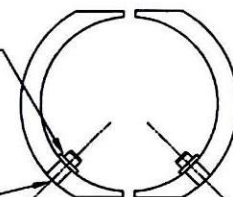
8 7 6 5 4 3 2 1



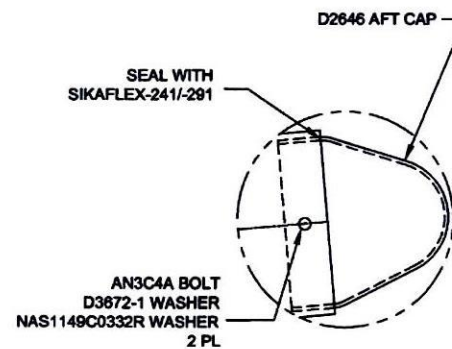
SECTION S-S
SCALE 5X
D6-4.9

DRILL $\varnothing 0.391$
CBORE $\varnothing 0.516 \times 0.040$ DEEP
INSTALL ALS4-428-165 INSERT
4 PL

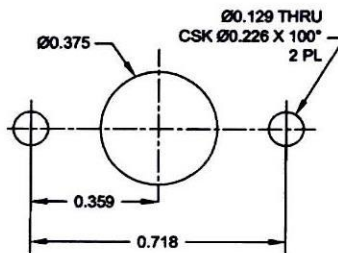
MS21075L5 NUTPLATE
REF
USE DT8217 DRILL TEMPLATE
TO LOCATE HOLES AND OPEN
TO $\varnothing 0.375$



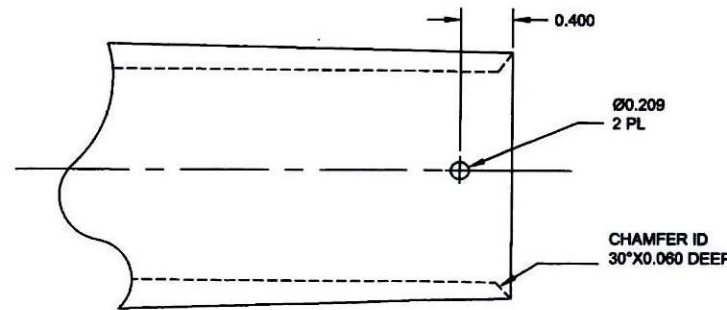
SECTION T-T
SCALE 5X
5 PL
D6-4.9
J



DETAIL U
SCALE 5X
D1-8.9



DRILLING DETAIL DD
SCALE 10X
D7-4.9
J
1



DETAIL EE
SCALE 2X
D1-11
J

NOTES:
1) USE INDUSTRY STANDARD NUT PLATE DRILL JIG IF REQUIRED.

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MFG. APPR.		D3391	SHEET 11 OF 11
APPROVED		TITLE	SCALE
DE APPR.		AFT TUBE ASSEMBLY	NTS
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8 7 6 5 4 3 2 1



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO038670**

Supplier: ATE003-VC
Atelier Debosselage
358 Principale
Calumet
QC
J0V 1B0 Canada
Phone: 819 242 5633

PO No: PO038670

PO Date: 12/18/17

Due Date: 12/18/17

Purchase Order

Revision:

Revision Date:

Ship-To Contact: Lavoie, Chantal
clavoie@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground

Pynt Terms: Net 30

Freight Terms:

Special Comments:

Items

Line Item	Job	Part	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	166956-B	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
2	166956-A	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
3	166956-E	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
4	166956-F	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
5	166956	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
6	166956-D	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
7	168393	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
8	166956-G	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
9	166956-C	D3391-023	Mid Tube Assembly	Firmed	12/18/17	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00

Grand Total: \$1,125.00

Order Notes

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 12/18/17 7:52 AM dart.lavoie.chantal